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Studies on Tuberculin Sensitivity in the Bovine *

by

W. R. KERR, H. G. LAMONT AND J. L. McGIRR

(*Continued from page* 446.)

PART III

The Stormont Test

In the course of the experiments on desensitization, it became evident that, following a single intradermal injection of tuberculin in an infected bovine, the original injection site exhibited a certain degree of enhanced specific sensitivity. This phenomenon could be detected six to nine days after the original tuberculin injection, but the optimum time for the development of the increased sensitivity has not yet been fully explored. For practical reasons seven days was chosen as the time between the primary and the "boost" injections in preliminary investigations.

Encouraging results obtained in initial experiments led us to refer back to the literature for any relevant information on methods of increasing skin sensitivity in tuberculous animals. It was found that Fellner (1919) had shown that the addition of an extract of a papular tuberculin reaction to a dilute tuberculin resulted in the production of a greatly enhanced skin reaction. This finding was confirmed and amplified by Martenstein and Schapiro (1923), by Martenstein (1923), and by Wichmann (1926). Weiss (1925) recorded that, whereas an inoculation of tuberculin at a point remote from the original site of a test produced a typical reaction, an injection into an old site resulted in a quickly appearing reaction. Buxton & Glover (1939), in experiments dealing with local desensitization following tuberculin testing, obtained indications that the injection of tuberculin in infected subjects resulted in the production of localized areas exhibiting a certain degree of increased sensitivity. Unfortunately, according to the data published by them, no reading was made within the 3- to 24-hour period following injections into the local areas of sensitization: the results recorded by us indicate that the maximum reaction to tuberculin occurs in the first 24 hours in such "sensitized" areas.

EXPERIMENTAL

Animals drawn from the laboratory stock at Stormont were tested in preliminary investigations and, thereafter, a selection of cows of unknown origin passing through Belfast and Ballymena Abattoirs were subjected to the test described below. (The Ballymena animals were subjected to test and autopsy by Mr. D. Campbell, M.R.C.V.S.).

Official Weybridge avian and mammalian tuberculins were used in all the test injections which were made in the neck site with avian above and about six inches distant from mammalian. Standard 0·1 ml. doses were injected and readings were taken at various intervals—in some cases at 1, 3, 5, 24, 48, 72 and 96 hours, and in others at a selection of these times. On the seventh day each of the original sites was re-inoculated with 0·1 ml. of the appropriate tuberculin (the "boosting" dose). Readings were taken at various time intervals thereafter and it was found that the "boost" reaction fades rapidly after 24 hours. The result tables record only the 48- and 72-hour and the seventh and eighth day readings. On the basis of the figures presented a positive reaction to the Stormont test is based on the rise to the "boost" injection between the seventh and eighth days. An increase of 5 mm. or more in skin measurement to the mammalian tuberculin injection is taken as positive evidence of mammalian infection *irrespective of what reaction is produced by the avian injection.* It should be noted that the deciding factor is the increase in thickness, not the nature of the reaction.

All the animals were subjected to thorough macroscopic *post-mortem* examination after the completion of the test and any suspect lesions, not obviously bovine, were subjected to animal inoculation.

With an arbitrary increase of 5 mm. or more taken as evidence of infection it is, of course, essential that measurements should be accurate and consistent. The calipers used by the authors are engineer's micro-calipers of simple design and of a type which has been used in Northern Ireland since 1928. Some years ago Professor Dalling suggested the addition of "lugs" to the jaws. The skin fold to be measured is gripped lightly between the caliper jaws, an even pressure being obtained by holding the jaws with the index finger and thumb of the left hand. The right thumb is then closed over the "nob" on the sliding rod to prevent any "springing" movement and the calipers are withdrawn and read. With experience, and where the readings are made by one person, it is possible to obtain very consistent results.

RESULTS

Detailed results are not given but Table I presents an abstract of the test results and autopsy findings, Fig. 1 indicates the distribution of infected and non-infected animals in terms of skin measurements, and the following paragraphs discuss the general findings.

TABLE I.

ABSTRACT OF TEST RESULTS AND AUTOPSY FINDINGS (300 ANIMALS)

Group No.	Test			Autopsy findings
	Single intradermal	Single intradermal comparative	Stormont	
I (1–164)	164 —	164 —	164 —	164 —
II (165–214)	50 +	50 +	50 +	50 +
III (215–230)	16 —	16 —	16 +	16 +
IV (231–239)	9 +	9 +	9 —	9 —
V (240–252)	13 ±	13 ±	13 —	13 —
VI (253–266)	14 ±	14 ±	14 +	14 +
VII (267–285)	19 +	19 —	19 —	19 —
VIII (286–295)	10 +	10 —	10 +	10 +
IX (296–300)	1 +	1 +	1 +	1 —
	2 —	2 —	2 +	2 —
	1 —	1 —	1 —	1 +
	1 +	1 +	1 —	1 +

SINGLE INTRADERMAL

Test results	Autopsy findings	
	Negative	Positive
183 —	166 —	17 +
27 ±	13 —	14 +
90 +	29 —	61 +
SINGLE INTRADERMAL COMPARATIVE		
212 —	185 —	27 +
27 ±	13 —	14 +
61 +	10 —	51 +
STORMONT		
207 —	205 —	2 +
93 +	3 —	90 +

GROUP I

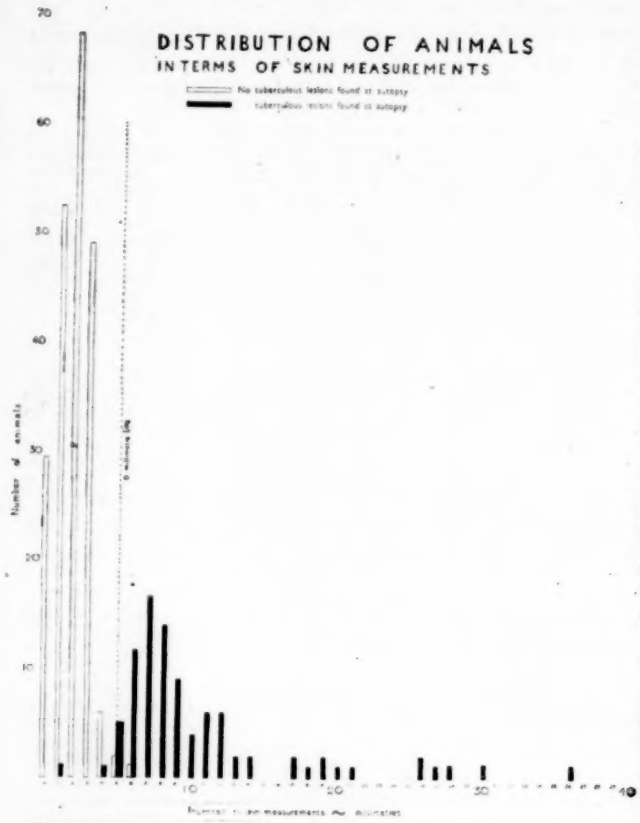
This group consists of 164 animals in which the single intradermal and the Stormont tests and the autopsy findings were in agreement in indicating that the animals were free from mammalian tuberculosis. The maximum Stormont test reaction to mammalian tuberculin was 4 mm. (shown by three animals).

One hundred and eight animals in this group evinced no evidence of any sensitivity to avian tuberculin, nine were non-specific reactors in the single intradermal test and (in view of their avian reaction of at least 5 mm. in the Stormont test) might be regarded as non-specific reactors in the Stormont test, 37 did not react to avian tuberculin in the single intradermal test, but might be regarded as non-specific reactors in the Stormont test, and ten were non-specific reactors to the single intradermal and non-reactors to the Stormont test.

Whether or not the differences in the ability of the two tests to detect non-specific sensitivity are of any significance must await further investigation. It is, however, interesting to speculate on the possibility that different types of non-specific sensitization may be involved.

* Presented to the North of Ireland Division, N.V.M.A., at Stormont, June 14th, 1946.

Fig. 1 (Table II)


DISTRIBUTION OF ANIMALS
IN TERMS OF SKIN MEASUREMENTS
No tuberculous lesions found at autopsy
Tuberculous lesions found at autopsy
Number of animals
Thickness of skin measurements (in millimetres)

Group II

This group consists of 50 animals in which the single intradermal and the Stormont tests and the autopsy findings were in agreement in indicating the presence of mammalian tuberculosis. The minimum Stormont test reaction to mammalian tuberculin was 6 mm. (shown by one animal).

Group III

This group consists of 16 animals which were non-reactors in the single intradermal and the single intradermal comparative tests: all 16 gave positive mammalian reactions in the Stormont test and all showed evidence of tuberculous infection at autopsy. That sensitivity was low was shown by the fact that many of the Stormont test reactions were small: one animal gave a Stormont test reaction of 5 mm., another 5·5 mm. and four increased by 6·0 mm.

Five of the animals gave reactions of over 5 mm. to avian tuberculin in the Stormont test: whether or not it is legitimate to take this as evidence of dual sensitization is a point which cannot, at present, be definitely settled, but experimental work on dual sensitized bovines suggests that this may be so.

Group IV

This group includes nine animals which, while positive mammalian reactors in the single intradermal and the single intradermal comparative tests, were non-mammalian reactors in the Stormont test and showed no macroscopic lesions of tuberculosis despite careful autopsy examination. It is interesting to note that not one of these animals showed evidence of non-specific sensitivity. The promulgation of any rational explanation of the positive reactions to the single intradermal test is difficult since, while the possibility exists that one or two of the animals may have been in the incipient stages of infection with a small and undetected focus of bacilli, it is extremely unlikely that all nine were in this state. Previous experience has shown that only a very small percentage of animals in this category (certainly not more than 10 per cent.) can be proved to be positively infected after minute and painstaking microscopic examination and animal inoculation of gland emulsions.

Groups V and VI

These groups include 27 animals which gave "doubtful" mammalian reactions to the single intradermal tests. All 27 showed increases of skin thickness of 3 mm. to mammalian tuberculin: 13 of these did not react to mammalian tuberculin in the Stormont test and showed no macroscopic lesions of tuberculosis at autopsy, while 14 reacted positively to the Stormont test and showed evidence of tuberculous infection at autopsy. Not one of the non-infected animals showed evidence of sensitivity to avian tuberculin in the Stormont test, and only one of the infected group gave an avian reaction. (None of the animals showed any evidence of avian sensitivity in the single intradermal test.)

Group VII

This group includes 19 animals which reacted as follows: positive in the single intradermal test, non-specific in the single intradermal comparative test, and non-mammalian in the Stormont test. Not one of the 19 showed macroscopic evidence of the presence of mammalian tuberculosis at autopsy. All but four of these animals gave marked reactions to avian tuberculin in the Stormont test. These results indicate the difficulties which must inevitably occur when using mammalian tuberculin only by the single intradermal method.

Group VIII

This group includes ten animals which were positive mammalian reactors in the single intradermal test, non-specific reactors in the single intradermal comparative test, and positive mammalian reactors in the Stormont test. All ten animals showed evidence of tuberculous infection at autopsy. Only four of this group gave marked reactions to avian tuberculin in the Stormont test. This set of results serves to stress the fallacies of the comparative interpretation in these animals of unknown origin.

Group IX

This group includes five animals in which the Stormont test reactions were at variance with the autopsy findings.

No. 296 was a positive mammalian reactor in the single intradermal, the single intradermal comparative, and the Stormont tests, and failed to show any evidence of tuberculous lesions at autopsy. The reaction to avian tuberculin in the Stormont test was also positive. It may be that this animal falls into the category described when discussing Group IV, *i.e.*, an animal with a small and undetected focus of infection.

No. 297 was a non-reactor in the single intradermal test, a non-specific reactor in the comparative test, and a positive mammalian (and avian) reactor in the Stormont test. No evidence of tuberculous infection was found at autopsy. The simplest explanation of the result in this case seems to be that the animal was, in fact, sensitized non-specifically and that the Stormont test failed to discriminate adequately between specific and non-specific sensitivity.

No. 298 was a non-reactor in the single intradermal and the single intradermal comparative tests and was just positive in the Stormont test. No evidence of tuberculous infection was found at autopsy. It is difficult to suggest an explanation of this result.

No. 299 was a non-reactor in the single intradermal, the single intradermal comparative, and the Stormont tests. Extensive tuberculous lesions were found at autopsy. This animal did show an increase of skin thickness of 4 mm. to mammalian tuberculin in the Stormont test, and may be considered as an error in the test due to lack of a sufficiently good degree of sensitivity.

No. 300 was a positive mammalian reactor in the single intradermal and the single intradermal comparative tests, and a non-reactor in the Stormont test. Evidence of mammalian infection was found at autopsy. It is felt that the error in this test may have been due to desensitization. This animal was tested by Mr. J. Ogg, M.R.C.V.S., eight days before the commencement of our tests and, in his test, gave an increase of 7 mm. to mammalian tuberculin. Thus, within 15 days the animal received 0·3 ml. mammalian and 0·3 ml. avian tuberculin. As recorded in Part II of this paper, 0·7 ml. tuberculin has been found to desensitize good reactors fairly completely.

Summary of Results on 300 Animals (Tables I and II)

By the single intradermal method 17 infected animals (5·66 per cent.) were recorded as negative, 29 non-infected animals (9·66 per cent.) were recorded as positive, and 27 (9 per cent.) were recorded as doubtful: of the doubtful animals 13 showed no evidence of infection at autopsy. By the single intradermal comparative method 27 infected animals (9 per cent.) were regarded as negative, ten non-infected animals were regarded as positive, and 27 (9 per cent.) were recorded as doubtful: of the doubtful animals 13

showed no evidence of infection at autopsy. These figures tend to suggest that, even in animals of unknown origin, the comparative test is more efficient than the ordinary single intradermal: the total error in the former is 12·33 per cent. plus 9 per cent. doubtful, while the total error in the latter is 15·33 per cent. plus 9 per cent. doubtful. These figures are, however, rather misleading since the comparative test missed 27 (9 per cent.) positively infected animals, while the ordinary single intradermal missed only 17 (5·66 per cent.). For the purposes of tuberculosis eradication involving the testing of animals of unknown origin the single intradermal would, therefore, seem to be preferable.

On the basis of the figures recorded the Stormont test is very much more efficient than either of the other two tests. The total error was 1·66 per cent. (five animals) of which 0·66 per cent. (two animals) represents infected animals not detected by the test. The method of interpretation used eliminates the need for a doubtful class. The question of a doubtful category is one of considerable difficulty. Table II indicates the "scatter" of the infected and non-infected animals in terms of skin measurements. The strict mathematical viewpoint indicates that, because of the many variable factors involved, a doubtful category is both necessary and inevitable: the utilitarian and practical angle, on the other hand, is that, if a doubtful category can be avoided without undue sacrifice of accuracy, this should be done. At the moment, the authors tend to support the viewpoint of "the man in the field."

Newly Calved Cows

The Stormont test detects the presence of specific sensitivity in the infected newly calved cow. Even in those animals which fail to give positive reactions in the single intradermal test the Stormont method elicits good positive reactions. It is certainly true that the seven-day interval between the primary and the "boost" injections required by the Stormont technique may result in the seven- to eight-day Stormont test reading falling within the period of returning sensitivity, but a sufficient number of tests have been done at different time intervals after calving to indicate that the Stormont test is much more sensitive in the newly calved cow than is the single intradermal test.

"Skin Tuberculosis"

The Stormont test, as at present applied, is incapable of differentiating skin sensitivity due to bovine infection and that due to so-called "skin tuberculosis." In cases of this type the single intradermal comparative test usually results in reactions which are classified as "inconclusive" though some cases react as mammalian positive while others do not react at all. Unfortunately, the Stormont test produces marked mammalian reactions in the majority of these cases and the test is, therefore, dangerous in herds where skin tuberculosis is present. Where clinical evidence of the skin condition is available the situation should not present undue difficulties but all the evidence suggests that there are a considerable number of cases where it is practically impossible to detect the presence of the condition.

We have, so far, slaughtered only three cases of the "skin lesion" type but information obtained from Mr. Whitty, C.V.O., Department of Agriculture, Dublin, indicates that the Stormont test is definitely misleading in herds infected with skin tuberculosis.

General Summary and Conclusions

1. Evidence is presented indicating that parturition results in a marked depression of skin sensitivity in the tuberculous bovine—of 20 positive mammalian reactors, seven animals failed to react immediately after parturition and five more would have been regarded as non-specific on the basis of the comparative test. Skin sensitivity returned to the normal pre-parturition level four to six weeks after calving.

2. The skin sensitivity of non-specific reactors was not affected by calving.

3. The colostrum of mammalian-infected animals contained specific antibody substances while no such antibody was detected in the colostrum of normal animals or in that of non-specific reactors.

4. Three of 13 colostral-fed offspring of mammalian infected mothers showed definite evidence of passive skin-sensitization, while two more might be considered as doubtful.

5. P.P.D. tuberculin desensitization of mammalian sensitized or infected bovines was relatively easily produced but such animals may still show typical reactions to the intradermal injection of heat-killed bacilli.

6. Cross-desensitization may possibly assist in the solution of the problem of the animal which shows comparable reactions to both avian and mammalian tuberculins.

7. A new approach to the problem of intradermal tuberculin testing in the bovine is described—the Stormont test. The results of tests on 300 animals are described in detail. The Stormont test had an error of 1·66 per cent. as against 15·33 per cent. plus 9 per cent. doubtful in the single intradermal test and 12·33 per cent. plus 9 per cent. doubtful in the single intradermal comparative test.

8. The Stormont test detects the depressed sensitivity of the infected newly calved cow.

9. Skin tuberculosis remains a problem in that the new technique fails to differentiate sensitivity due to the bovine infection and that due to skin tuberculosis.

The significance of the findings regarding the effect of parturition on skin sensitivity and the antibody content of the colostrum appears to be considerable. In the first place, the reliability of the tuberculin test immediately after calving is open to question and, in the second place, the possible passive sensitization of newborn calves may render suspect the results of tuberculin testing in such animals and also suggested that vaccination of the B.C.G. type may entail a certain risk owing to possible reaction with circulating or fixed antibody still persisting in the calf.

The results of the desensitization experiments are interesting. In the first place, these experiments provide further evidence for the thesis that tuberculin should be subjected to much more rigid "sales control" than is at present imposed. In the second place, they suggest that the question of P.P.D. tuberculin issue strengths should be very thoroughly investigated, while, in the third place, they indicate another method of approach to the difficult problem of the elucidation of the mechanism of the tuberculin reaction and, incidentally, of non-specific sensitivity.

The Stormont test results are such that this method of testing and the many modifications which suggest themselves would seem to merit attention and further investigation.

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Discussion

Dr. R. F. Montgomerie expressed his great pleasure at being invited to the meeting and being asked to open the discussion. He had by no means digested the facts and figures presented and he congratulated the three speakers on the immense amount of work they had done and compiled together in such a short space of time.

He agreed that the character of the swelling was of little significance in interpretation. This was his own experience in England. P.P.D. tuberculin was a great advance in tuberculin testing and we must appreciate the advantage in specificity it has over O.T.

Dr. Montgomerie asked Dr. Kerr to explain what he meant by an "early" reaction. Surely he did not accept the swelling noticed two to three hours after the injection as being specific? When was the optimum time to read after the "boost" injection? He agreed that tuberculin syringes should be used for tuberculin testing only and suggested that all such glassware should be permanently marked. Skin tuberculosis had been an important problem in Great Britain and he was glad to see that the speakers found their cases especially sensitive to mammalian tuberculin. This had been his own experience in Great Britain. He congratulated the workers on noticing the drop in skin sensitivity at calving. The time when this sensitivity returned to normal was extremely important. Did the speakers know when this occurred? He was also interested in the strength of tuberculins, as the mammalian contained 1·5 mg. per ml. and avian only 0·4 mg. per ml. Would any advantage be obtained if smaller doses were given, especially in the Stormont test? He certainly believed that the comparative test should only be done by experienced men. The complications in interpretation were most confusing and he was glad to see that the Stormont test appeared to eliminate the non-specific reactor, as the use of avian tuberculin was apparently not necessary. The history of the herd, he believed, was essential when interpreting reactions. The two positives "missed" by the Stormont test might very well have been suspected had their history been known.

The desensitization phenomenon startled him as he did not realize this occurred with the intradermal test. The tuberculin test could be gravely endangered if the public learned the significance of a preliminary subcutaneous or intramuscular injection. Apart from that, however, he thought that the Stormont test would possibly alter the whole conception of tuberculin testing. He congratulated the speakers once again and wished them luck in their continued research.

Mr. G. N. Gould: He congratulated the three speakers on their excellent addresses and expressed his pleasure at being present to take part in the discussion. He had been fortunate enough to be in Ulster when the preliminary trials on the Stormont test were being carried out.

He had noticed—or rather his herdsmen had noticed—the loss of hypersensitivity in calving cows in England. He had one particular "problem" herd at present and the results to date tended to show that the trouble was due to these calving cows. Mr. Gould was not quite clear about the 5 mm. rise and if the Stormont test was a comparative test or not. He agreed about the herd problem where "skin tuberculosis" was present. Did the affected skin areas show a focal reaction after tuberculin testing? The desensitization experiments were very important; but just how far did the subcutaneous injection interfere with subsequent tests? He was glad Dr. Montgomerie stressed the importance of the herd history in interpretation of the test. He also agreed with him that the character of the swelling was of no significance. The terms "diffuse," "circumscribed," etc., were out of date. Accuracy in reading was more important and although the Stormont calipers were the best he had used he thought something even more accurate could be devised. Mr. Gould mentioned that in order to avoid the use of ordinary-glass syringes, the National Veterinary Medical Association Committee had suggested that tuberculin be issued in special cartridges. Otherwise standard syringes could be coloured. Finally he asked what the Stormont test had done in Grade A herds in Northern Ireland.

Dr. W. R. Wooldridge thanked Dr. Lamont and his colleagues for such an invaluable survey of tuberculin hypersensitivity. He advised the workers in their attitude towards the new test; they knew it was not 100 per cent. efficient and would continue to strive for perfection of the test. A great dis-service was done to the work on the double intradermal test when it first came out in accepting it as being the final answer. His only criticism of the Stormont test was about the 5 mm. rise. Was this purely arbitrary? He would like to see all the figures analysed statistically. Were many of the positives near 5 mm.? The mean was important and it might be helpful to introduce a range such as 4-6 mm. He would also like to see various sites used for the Stormont test and calving cows being given the first injection before, during and after calving. Valuable information might be got from this type of experimenting. Dr. Wooldridge was surprised that no reference had been made to the present double intradermal test. He was not clear where this came into the comparison. He also wondered if there was any logical explanation for the breakdown of udder cells in robbing the skin of its sensitivity.

Mr. J. Adams (Omagh) asked if the depth of the injection made much difference. Could it not be smaller than at present? In his opinion the superficial injection was the more sensitive.

Mr. J. Ogg said that the comparative test when first introduced into Northern Ireland was much better than the ordinary single intradermal when used in herds of known history, but the new Stormont test was even better. The non-specific reactor was removed. Was the optimum time for the second injection seven days or had any other interval been tried? He wondered if any of the speakers knew the cause of non-specificity in the comparative test. He understood that the desensitized animal responded to an injection of dead organisms. Would this shed any light? He also asked if the antibodies in colostrum were humoral or cellular, and if Dr. Kerr had any views on the passive transference of these to the calf's skin.

Mr. R. W. Cassells (Newtownards): As a severe critic of the tuberculin test he was glad to say that not until this new test had been introduced had he begun to have faith in it.

The Replies

Dr. Montgomerie's question regarding the "early" reaction raised a subject upon which a considerable amount of confusion appeared to exist. In the first place it was certainly true that reactions of 2·3 mm. or more occurred in the first few hours after injection in many bovines which were definitely free from infection. In that sense the "early" reaction must be regarded as non-specific in the widest sense of the term. On the other hand anaphylactoid reactions of this nature could be produced in animals sensitized by specific tuberculo-protein and it was relatively certain that specific tuberculo-protein anaphylactoid reactions could and did occur in many infected animals. Such animals, therefore, were regarded as giving specific "early" and specific "late" (true tuberculin) reactions. The connotation of the term "early" as used in this paper was of the latter type. It might be advisable at this stage to stress again the fact that the specific anaphylactoid "early" reaction was quite distinct from and unrelated to the bacterial hypersensitivity reaction upon which tuberculin test diagnoses depend.

On the basis of numerous readings it appeared that the optimum time of reading after the "boost" injection was 24 hours although the maximum reaction occurred several hours sooner. The "boost" reaction, though it occurred rapidly and faded relatively quickly, was not of the anaphylactoid type.

The period required for skin sensitivity to return to its preparturition level after calving was, of course, variable, but complete return probably did not take place for at least four weeks and six weeks might be regarded as the average period. The matter of the strengths of the P.P.D. tuberculins used was certainly important and experiments had been initiated to investigate this question. It seemed likely that mammalian tuberculin strength could, with advantage, be considerably reduced—say to 0·75 mg./ml. or even to 0·5 mg./ml.

In reply to Mr. Gould: The Stormont test was not comparative; avian P.P.D. had been used merely for the purpose of acquiring additional information. A focal reaction at skin lesion sites had not been noticed after tuberculin injection but this question would receive attention in subsequent testing. The question of the desensitizing effects of subcutaneous tuberculin injections had not yet been sufficiently thoroughly explored, but it seemed likely that injections of this sort might upset intradermal testing quite considerably. The Stormont test had, so far, been used in only one Grade A herd and for only two tests but the results had been entirely satisfactory despite the fact that the herd in question suffered from a very considerable degree of non-specific sensitivity.

Dr. Wooldridge's question regarding the use in the Stormont test of an arbitrary standard of 5 mm. or over for reactors raised an important point. If a doubtful class were introduced with readings ranging from 4-6 mm. inclusive, 28 animals (nine non-infected and 19 infected) would fall into this category. Only one animal, unfortunately an infected one, would then be classified as an absolute error. This method of classification was undoubtedly correct from the mathematico-scientific point of view but, to the worker involved in field testing, a doubtful category represented a bugbear of no inconsiderable magnitude. It was felt that, if this type of classification could be avoided without undue sacrifice of accuracy, the "field man" should not be saddled with this bugbear. Hence the decision to omit the use of a doubtful category. This decision of course necessitated extreme care and accuracy in the taking of skin measurements.

The question of injection "siteing" had not been investigated but it seemed likely that, with the Stormont test, siteing was not quite so important as with the single intradermal method. As for the use of the double intradermal method, the authors had not investigated the question of whether the double intradermal test could be followed seven days later by the Stormont "boost" injection.

Regarding Mr. Adams' question, the depth of the injection of the tuberculin was probably of some consequence. The impression gained by the authors was that superficial injections were preferable.

Mr. Ogg had asked about the optimum time for the Stormont test second injection—the matter had not been sufficiently well investigated but the optimum period lay somewhere between the fifth and the tenth days. The seven day period had been chosen largely as a matter of convenience. The fact that the desensitized animal B.48 had responded to the intradermal injection of dead organisms appeared to offer considerable opportunities for further work. It suggested that infection resulted not only in sensitivity to tuberculin but also in sensitivity to a constituent of the bacilli other than tuberculo-protein. The relationship of the colostrum antibody substances detected by the precipitin test and the substances responsible for both maternal and calf skin sensitivity remained to be elucidated.

WORLD ORGANIZATION OF MUSEUMS

A paragraph in *The Times* of August 20th reported an American movement towards the establishment of an international organization of museums. This envisages the promotion of: (1) international exchange exhibitions, (2) the exchange of museum specimens, (3) the exchange of staff, (4) the establishment of travelling scholarships, and (5) the establishment of an international school for training young men and women in museum work. Mr. Chauncey J. Hamlin, Chairman of the Policy Committee of the American Association of Museums, and President of the Buffalo Museum of Science, has visited several European countries, and this has resulted in the formation of committees (which will work upon the proposals) in France, Switzerland, Holland and Belgium. It is to be noted that each of these committees is composed of leading museum officials. Mr. Hamlin has also been in touch with officials of the United Nations Educational, Scientific and Cultural Organization, and before his return to America he was in London to discuss with the Museums Association and directors of leading British museums the possibility of the formation of a British committee to work along the same lines.—Nature.

* * * * *

The Pharmaceutical Association of Australia and New Zealand, at their annual conference held at Adelaide from August 19th to 21st last, passed the following resolution: "That the constituent Societies of this Conference be requested to communicate with their State Veterinary Boards, requesting that they endeavour to have uniform requirements for veterinary medicines instituted throughout the Commonwealth."

* * * * *

Dartmoor ponies have become more popular than ever, and in addition to a big home demand the Society have had recent enquiries from Canada, South Australia and New Zealand. Broken ponies fetched up to £35 at Princetown and unbroken from £9 to £14 (£1 each before the war). Suckers, which formerly sold for a shilling, made from £5 to £6 10s.—*Farmer and Stock-Breeder.*

The Stormont Tuberculin Test: A Statistical Analysis

By

F. W. PRIESTLEY

Veterinary Remount Depot, R.A.V.C., Melton Mowbray

The figures on which Kerr, Lamont & McGirr (1946) have based their conclusions are too voluminous for present publication. I have, therefore, been asked, with the concurrence of the authors, to summarize the results and submit them to a simple statistical analysis.

Some 2,984 readings on 300 animals were taken; 92 of the animals were positive on *post-mortem* examination and 208 were negative. To ascertain the accuracy of any method of diagnosis some basis of comparison is clearly necessary; since the practical object of the tuberculin test is to pick out animals that will show lesions on *post-mortem* examination, a classification of positive or negative at autopsy is justifiable.

The readings are summarized in Table I in the exact form as given by Kerr, Lamont & McGirr for the individual animals. From this it may be seen that the following points are established:—

1. In autopsy-negative animals there is no difference between the two types of tuberculin, *i.e.*, the maximum increases obtained are similar.

2. In autopsy-positive animals, tested by the single intradermal test, the mean maximum increase given by mammalian tuberculin (6·8) is greater than that given by avian tuberculin (2·5). The difference (4·3 ± 0·51) is a statistically significant one (t = 8·256, n = 91, p = < ·001).

3. With the Stormont technique avian tuberculin is unable to distinguish between positive (3·8) and negative (4·0) animals.

4. With the Stormont technique, mammalian tuberculin shows a significantly greater increase in positive (10·7) than in negative (2·0) animals.

5. Using mammalian tuberculin in autopsy-positive animals, the Stormont test (10·7) shows a higher mean maximum increase than does the single intradermal test (6·8). The difference (3·9 ± 0·51) is again significant (t = 7·624, n = 91, p = < 0 ·001).

The fact that one test gives a mean reading higher than another does not necessarily imply that the former is a better test than the latter. The only way of determining this is to compare the numbers of positives and negatives classified by the tests with the numbers known to be positive and negative. Before such a comparison can be made, however, it is necessary to determine which reading gives the least error, or in other words, to decide what is to be classified as a positive and what as a negative. Table II shows the numbers of animals that would be classified as positive at various readings. Thus, for instance, with a single intradermal reading of 2·0, ten known positives would be missed (10·9 per cent.) and 56 known negatives would be classified as positive (26·9 per cent.); this gives a mean error of 18·9 per cent. From Table II it would seem that in general the least error would be obtained by regarding as positive an increase of 2·0 in the single intradermal and of 5·0 in the Stormont test. With the particular series of 300 animals under review the least error is obtained with increases of three or four with the single intradermal and five with the Stormont test. Kerr and his colleagues have tentatively suggested that an increase of five in the Stormont test gives the least error and this conclusion is amply justified.

The χ^2 test is a convenient one for testing the relationship between infection and reaction to tuberculin. The necessary tables can be constructed from the figures given in Table II. With both techniques it will be found that there is a definite and significant relationship. It is evident, however, that the Stormont readings give a better "fit." A direct comparison of one technique with the other is shown in Table III, from which it may be seen that the difference is not such as could reasonably be expected to have arisen by chance; in other words, the Stormont technique is undoubtedly the better one.

Summary

The Stormont tuberculin test gives significantly greater skin thickness readings than the single intradermal test in known positive animals. The smallest error was obtained by classifying increases of 5·0 and above as positive.

The Stormont test was able to select autopsy-positive from autopsy-negative animals with an average error of only 1·8 per cent. as compared with an error of 18·9 per cent. in the single intradermal test.

Reference.—Kerr, W. R., Lamont, H. G., & McGirr, J. L. (1946.) *Vet. Rec.* **58.** 443.

Table I

Showing the Skin Measurements (mean values) of Animals subsequently found to be Positive or Negative on *Post-mortem* Examination

Autopsy	Tuberculin	Single intradermal				Stormont		
		Initial	48 hours	72 hours	Maximum increase	7 days	24 hours later	Maximum increase
Positive	A.	7·2	9·1	9·7	2·5	9·3	13·1	3·8
	M.	7·1	11·9	13·8	6·8*	10·8	21·5	10·7
Negative	A.	7·5	9·0	9·3	1·8	9·0	13·0	4·0
	M.	7·3	8·6	8·7	1·6*	7·9	9·9	2·0

A. = avian. M. = mammalian.

* The mean maximum increase shown may differ from that calculated by subtracting the initial from the 72-hour reading because occasionally the maximum was obtained at the 48th-hour reading.

Table II

Showing the Number of Animals that would be Classified as Positive at Various Readings (maximum increase)

	Positive at an increase of						
	1	2	3	4	5	6	
Autopsy—							
Positive (92) ...	87	82	75	61	53	...	Single
Negative (208)...	128	56	42	28	22	...	intradermal
Mean percentage error	33·5	18·9	19·4	23·6	26·5	...	
Autopsy—Positive	...	...	...	91	90	83	
Negative	...	...	...	8	3	1	Stormont
Mean percentage error	....	...	...	2·5	1·8	7·3	

Table III

A Comparison of the Stormont and Single Intradermal Tests

	Autopsy positive	Autopsy negative
Test positive ...	75 (90)	42 (3)
,, negative ...	17 (2)	166 (205)
Total	92	208

$\chi^2 = 629{\cdot}420$. n = 2. p = < 0·001.

Figs. in brackets = Stormont test; Other figs. = single intradermal test.

THE "ROTOLACTOR" SYSTEM

The *Home Farmer* records the receipt of an interesting brochure which describes with illustrations the Walker-Gordon system, which has as its main feature the "Rotolactor"—otherwise known as "The milking merry-go-round." It is claimed for these installations, of which two are in existence in the U.S.A., that they can be used efficiently in herds of from 300 to 3,000 cows, and that they provide "the most sanitary and hygienic method of handling milk from the cow to the bottle."

"The apparatus, to judge from the illustrations, is an impressive piece of work. One of the two plants accommodates 50 cows at a time, and revolves once in 13 minutes; when the cows have mounted the platform, they are washed and dried, foremilk is examined, they are milked, and the equipment is automatically washed and sterilized after each milking. The milk is automatically weighed and flows through a sanitary pipe to the dairy, being untouched by hand throughout."

CLINICAL COMMUNICATIONS

Impaction of the Stomach in the Cat

DIANA R. CAMPBELL, M.R.C.V.S., and
LEONARD R. GEFFEN, M.R.C.V.S.

Subject.—A long-haired white Persian cat, aged two years.

History.—Inappetence for two days and general inertia. No history of emesis.

Examination revealed a large hard mass lying well back on the left side of the abdomen. The temperature was 102·2° F. A tentative diagnosis of neoplasia of the mesenteric lymph gland, involving the intestine, was made. The owner requested an exploratory laparotomy.

Laparotomy was performed mid-line. On examination it was found that the large body palpated was a grossly enlarged stomach. The stomach was incised along the greater curvature and a hard impacted mass of hair, food and digestive juices was extracted This mass was oval in shape, over five inches long, three inches wide and varying in thickness from one to two inches. The stomach and abdomen were closed in the usual manner.

The next morning, the cat was found to be suffering from severe shock and a subcutaneous injection of ten ounces of glucose saline was given. The skin sutures were removed on the fourth day. The cat made an uneventful recovery.

* * * * *

Persistent Infection of the Uterine Stump following Ovaro-hysterectomy

DIANA R. CAMPBELL, M.R.C.V.S., and
LEONARD R. GEFFEN, M.R.C.V.S.

Subject.—Chow bitch, seven and a half years of age.

History.—This bitch was operated on for pyometra in June, 1944, the surgeon removing the uterus and only one ovary. Since operation the bitch had been coming into oestrus at irregular intervals, varying from six to eight weeks.

The dog was first seen on September 22nd. Symptoms observed were those of acute pain, especially in the regions of the loins and hind legs, and the animal was unable to walk. There was a muco-purulent discharge from the vulva with a typical acrid odour. Rectal palpation revealed a large body lying immediately in front of the brim of the pelvis.

Laparotomy was performed through the left flank on September 24th, under morphine and hyoscine and ether. A sound was passed through the vulva and cervix into the stump of the uterus. On entering the abdomen it was found that there were a large number of adhesions, through which the sound in the stump could be distinctly palpated. These adhesions were carefully broken down and the enlarged stump drawn up into the incision. The stump was then amputated at the level of the cervix. No large blood vessels were encountered, and there was no haemorrhage whatsoever. The incision was closed in the usual manner. On being opened and examined, the stump was found to be fibrosed and tumefied and to contain about one ounce of thick pus.

Two hours after the completion of the operation, the bitch died without regaining consciousness. It is believed that death took place from heart failure, the heart muscle having degenerated due to prolonged toxaemia.

"NORTHERN IRELAND"

Many members of the association with happy memories of the Belfast Congress, and hopes of revisiting the Province, will welcome the attractive and well illustrated booklet by Dr. Hugh Shearman, obtainable free on application to Ulster Office, 21, Cockspur Street, London, S.W.1. In addition to an interesting historical survey, the social, industrial and agricultural life of Ulster is portrayed, and its many natural attractions for the visitor are set forth. The booklet records the remarkable achievements of the farmers of Northern Ireland in maintenance of the food supply of the British Isles during the war, which included a phenomenal expansion of the poultry industry.

* * * * *

WEEKLY WISDOM

Oh, the hollow convictions that are conceived in ignorance, pregnant with egotism, and born of potted thinking!—Carl Roman.

ABSTRACT

[**A Peculiar Dermatitis of Cattle.** PRIOUZEAU, M. (1946.) *Bull. Acad. vét. Fr.* **19**. 53-68.]

Sixteen cases of a specific dermatitis of cattle have been observed during 25 years. The disease is extremely serious and at its onset may be confused with foot-and-mouth disease. The condition, however, is non-contagious. It is characterized by an acute febrile attack followed some time later by the development of lesions on the skin and occasionally on the mucous membranes, or the lesions may develop without the initial fever. The skin lesions commence low down on the limbs and spread slowly upwards; the coronets are swollen, reddened and extremely sensitive to digital pressure. The interdigital spaces show haemorrhagic furrows, the point of the nose and the edges of the nostrils being similarly affected and interfering with prehension, and causing much loss of condition. The animal has difficulty in rising and walking. Finally there is a generalization of the condition. The lesions on the nose spread to the lips and mucous membrane of the mouth; the teats swell and milking becomes impossible. On various parts of the body numerous painless hard "buttons" (1 to 5 mm. in diameter) appear and there is rapid and progressive cachexia. Secondary infection of the lesions usually precedes death which is due to inanition.

The age of affected animals varies from eight months to four years, the disease appearing in both housed and pastured cattle; cases are always sporadic and the cause has not been determined. Death has invariably supervened in from three to eight months of the onset.

J. S. P.

REPORT

[**Tanganyika Territory:** Annual Report of the Department of Veterinary Science and Animal Husbandry for the year 1944.]

Drought conditions which obtained over the greater part of the Territory during 1943 continued into 1944 and heavy losses from starvation were reported in the first quarter of the year. Subsequent rainfall was adequate for the most part and the livestock industry showed rapid recovery. Census figures showed a marked drop in cattle, sheep and goat populations due mainly to increased slaughtering to offset as far as possible the shortage of cereal foods occasioned by continued drought. Despite these adverse conditions the output of animal products was maintained at a satisfactory level.

On the disease side, rinderpest (cattle plague) was kept confined to that part of the Territory lying north of the Central Railway; there was some improvement in regard to the incidence of contagious bovine pleuro-pneumonia but little progress was made against other notifiable diseases. The ratio of professional field staff to numbers of cattle (about one to 240,000) and to area (one to 16,000 square miles approximately) was, of course, quite inadequate even for proper epizootic control which is only part of the routine work of the veterinarian in tropical Africa.

The report includes observations on such aspects as: Disease Control, Animal Husbandry and Genetics, Livestock Trade, Hides and Skins and Leather, Fresh Butter, Milk and Cheese, Clarified Butter, Poultry and Eggs, Veterinary and Animal Husbandry Education of the African, etc., etc., and although a war-time abridged edition, provides a very readable and interesting record of an extremely difficult task well done.

S. A. F.

WARBLE FLY DAMAGE TO HIDES

At a recent meeting of the Central Committee of the Hide Improvement Society (states the *Meat Trades Journal*) it was reported that considerable interest had been aroused in parliamentary circles following the receipt by M.P.s of the Society's circular enclosing a specimen of warbled leather in the shape of a sole.

As a result of pressure brought on the Ministry of Agriculture a fairly definite promise had now been given that the compulsory Warble Fly Dressing Order would be reinstated for 1947.

The Committee were strongly of the opinion that if the Order was to be effective, a great deal of prominence would have to be given to its provisions in agricultural publications, wireless talks, and through the County Agricultural Committees. They felt that the attitude of the Ministry of Agriculture to this matter during the past two or three years had been very lukewarm and that only limited progress would be made unless an enthusiastic approach was made to the problem by the Ministry.

Questions and Answers

"Questions and Answers" will be published on alternate weeks.

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Control of Canine Helminthiasis by Anthelmintics

Q. CLXVI.—*The writer seeks details on the use of anthelmintics as part of a campaign to control a high incidence of helminthiasis in a large greyhound breeding kennel.*

(a) With a view to the prevention of pre-natal infestation, at what stage of the gestation period may a bitch be dosed with safety for ascariasis and hookworms?

(b) Where strongyle-like eggs are found in the faeces of a two-weeks-old puppy, may he be dosed with safety for Uncinaria stenocephala *(at this age)?*

(c) Where a puppy has acquired pre-natal infestation with Toxocara canis, *is it useless to dose him before he is two months old—at which stage the worms become adult?*

(d) Assuming that a puppy, before he opens his eyes, may swallow a flea or louse, is it reasonable to suggest that puppies should be dosed for Dipylidium caninum *when they are six weeks old?*

(e) Assuming that a bitch may vomit meat for her puppies as soon as they begin to eat it, should puppies be dosed for Taeniasis *at three months old?*

(f) How soon after weaning should meat be fed to puppies?

(g) What is the safest and best hookworm anthelmintic (giving dosage)?

A.—(*a*) Anthelmintics may be administered at any time during gestation up to about three weeks of parturition. With possibly one exception, it is not the specific that may harm a pregnant animal, but the degree of catharsis induced, and if this is only mild there is little to fear. The exception is probably Ol. chenopodium which has been reported from time to time as apt to produce abortion.

When a bitch is known to be pregnant there is no reason why elimination of parasites should not be proceeded with at once. Pre-natal infestation depends upon the acquisition of the infective stage of ascarids or hookworms by the bitch, and any infestation by adult worms that she may be carrying while pregnant is only of importance because of the resulting contamination of her surroundings and the increased risk of picking up infective eggs or larvae by mouth. The prevention of pre-natal infestation therefore depends upon effective treatment of older animals; thorough cleansing and disinfection of all premises or land to which they have access; frequent examinations of faeces—especially of the newcomers; and just prior to gestation, a thorough cleansing of the bitch's hair and skin; the washing of all food and water receptacles, and the removal of droppings.

The ground on which animals are kept should be as dry as possible because it is known that the pre-infective larvae of hookworms are not resistant to drying.

Hookworm infested soil may be sterilized by the use of strong salt brine made by stirring 1¼ lb. salt into a gallon of boiling water and then sprinkled over the soil surface to saturate the earth to a depth of ¼ to 1½ in.

(*b*) The writer has not dosed puppies at two weeks old and would consider it very dangerous to do so. If no adult worms or symptoms are present he would advise waiting until these exist and are becoming a menace, by which time the host would be older and better able to resist treatment. If a vermicide is essential, then probably tetrachlorethylene would be the safest for young puppies.

(*c*) and (*d*) Answers to these questions are largely covered by reply to (*b*). It is certain that many puppies of tender age are killed annually by too early administration of anthelmintics. In cases of hookworm infection severe enough to cause anaemia and weakness, it is often wiser not to give a vermicide, but an iron product aimed at sustaining blood level while reinfestation is avoided by sanitation. The most satisfactory drug for this purpose is iron and ammonium citrate prepared in 4 gr. capsules and administered twice daily over a period of two weeks or more.

(*e*) It is inadvisable to treat for worms on a pure assumption. The writer believes that unless worms, segments or eggs have actually been demonstrated, it is worse than useless to treat for what may not exist. Among the laity there is an ever-increasing urge to be dosing dogs for one thing or another almost as soon as they open their eyes, and it is to be deprecated. Three months of age is, of course, not too young to treat for tapeworm—if such exist.

(*f*) As soon as a puppy has learned to lap from a saucer, it has been the writer's practice to offer minute portions of raw meat. As soon as the taste for meat has been acquired, then this is fed to growing pups in gradually increasing quantity daily, and with excellent results.

(g) Tetrachlorethylene and carbon tetrachloride are the two best drugs for hookworm, and the first-named is believed to be as effective as is carbon tetrachloride, but has not its toxicity. Tetrachlorethylene should be followed by a saline purgative and the patient should be given plenty of milk. The potency of this drug is increased by the addition of Ol. chenopodium.

Fats should be eliminated from the diet the day before dosing, and a safe amount to administer is approximately 1 c.c. per 10 lb. body weight.

Shock Cases in Animals due to Liberation from Tissue Cells of Histamine into the Blood Stream

Q. CLXVII.—*Assuming that many cases of shock in animals are due to damage of tissue cells and the liberation from them of histamine into the blood stream, is there any agent that you can suggest which will neutralize or combat the histamine if administered at the time of the injury? Can you suggest any local application that could be used as a uterine irrigant that might prevent histamine being liberated from tissue damaged at parturition?*

A.—It is generally agreed that the liberation of histamine from various tissues, the particular organ or tissue mainly concerned varying in different species, is of importance in the vascular changes occurring in anaphylactic shock. In the dog, for instance, experimentally induced shock brought about by injection of foreign protein is accompanied by liberation of large amounts of histamine, mainly from the liver, and the level of histamine in the blood rises. Recovery from the fall in blood pressure runs parallel with the subsequent fall of the level of histamine in the blood. Subcutaneous injection of histamine in the dog causes a marked fall of blood pressure, and animals which succumb show haemorrhage into the intestine, oedema of the gall bladder, and congestion of the liver. Recent work on histamine shock in the dog has shown that the injection of a colloidal agent (methyl cellulose) together with a vasotonic agent (S-methyl isothiourea sulphate) is of considerable benefit.*

The liberation of histamine is also of importance in a number of allergic conditions in man, such as hay fever, serum reactions, drug sensitization, vasomotor rhinitis, etc. In an attempt to neutralize the effects of histamine in these conditions a new chemical compound "Benadryl" (β-dimethyaminoethyl benzhydryl ether hydrochloride) has recently been introduced and its use has been reported from the United States and this country.† The drug has a powerful anti-histamine and antispasmodic action, as shown by the relief afforded from bronchospasm and anaphylactic shock experimentally induced by histamine. Good results have been reported in man in hay fever, urticaria, contact dermatitis and dysmenorrhoea. The average dose is 50 mg. given by mouth in a capsule three or four times daily. The drug possesses low toxicity and rarely causes untoward reactions. Dogs given 10 to 20 mg. per kg. body weight for six months remained in good health.

If the questioner is prepared to assume that histamine plays a part in the production of "shock" from damaged tissue at parturition there is no reason why the new anti-histamine preparation should not be tried. It seems to be adsorbed at the site of action of histamine and perhaps competes with histamine at this site, a mechanism of antagonism like the atropine-acetylcholine or *p*-aminobenzoic acid-sulphonamide systems. "Benadryl" should be given by the mouth and it should be remembered that it is palliative only and that symptoms usually recur when the drug is discontinued.

* Hueper, W. C., & Ichniowski, C. T. (1943.) *J. Pharmacol. & exp. Therap.* 78. 282-295.

† Harley, D. (1946.) *Lancet.* August 3rd, p. 158.

("Benadryl" was synthesized in the laboratories of Parke, Davis and Co., by Rieveschl and Huber.)

Properties of Animal Blood

Q. CLXVIII.—*Do blood groups exist in the blood of our patients, or may we give a blood transfusion with the sole proviso that the "donor" is of the same species as the recipient?*

What is the principle of the parentage test based on the antigenic characters found in red blood corpuscles, and would this test enable us to say whether a day-old puppy was sired by a certain greyhound or not?

A.—Blood groups exist in all animals but isoagglutination is weaker than in man and more complicated tests are required to demonstrate its presence. Transfusion is regarded as safe in domesticated animals with the exception of the horse. In the horse compatability is tested by mixing buffered dilutions of the donor's and recipient's blood, or, alternatively, introducing a test dose of up to 200 ml. of the donor's blood and noting its effect before deciding to transfuse larger quantities.

Parentage tests depend on the fact that the inheritance of the main blood groups and of the various sub-groups is in accordance with Mendelian principles. Thus in cattle each cellular antigen is the product of a single gene or of linked genes and no calf can possess an antigen unless it was present in the cells of one or both its parents. Antigens in other animals may be inherited as a dominant or a recessive. In dogs the demonstration of blood groups is a highly technical procedure and at present too few groups have been determined to permit a practical test in disputed parentage.

* * * * *

Correspondence

Hormonal Prevention of Oestrus. (Q. CLXIV.)

Sir,—It would be helpful if the writer of the answer to the above query would cite evidence in support of the following statement which he makes: "While the various oestrogens induce oestrus if given in small dosage, it is true that they have the reverse effect in large dosage."

It is agreed that there is ample evidence that large and continued doses of oestrogens will suppress the normal functioning of the ovary and produce ovarian hypoplasia, but this does not mean that symptoms of oestrus will not appear. Although the production of oestrogens by the ovaries may be drastically reduced by such treatment, the oestrogens administered will themselves cause very marked symptoms of oestrus or even of nymphomania [as in cows implanted with oestrogen tablets (Folley & Malpress, 1944)]; and unless the writer can produce evidence to the contrary it can only be assumed that his suggested treatment, far from suppressing normal oestrus, would intensify and prolong it.

The further statement that menstruation in women can be suppressed by oestrogen therapy has no bearing on the question whatsoever, since menstruation in primates is an *entirely different physiological phenomenon* from oestrus and occurring at the opposite phase of the sex cycle.

The writer, apparently continuing this false analogy with menstruation, has coined the verb "*to oestruate*." Are not the established terms "to be in heat" or "to be in oestrus" adequate and precise? The introduction of a monstrosity such as "to oestruate" is confusing and to be condemned. Similar objection must be taken to the adjective "*oestrual*." Asdell (1931, 1932), Tyson (1931) and Corner (1937) have dealt with the derivation and spelling of the word "oestrus" and its derivatives and it is clear that the correct spelling of the noun and adjective respectively is "oestrus" and "oestrous" (cf. mucus, mucous).

The first part of the above question was answered previously in "Questions and Answers" (1945), when the use of progesterone or testosterone was suggested. In neither answer, however, has any reference been made to a paper by Koch (1936), who describes the use of a preparation of chorionic gonadotrophin in oil to suppress oestrus in bitches and cats by producing extensive luteinization of the ovaries. This method would appear worthy of trial. A suspension of chorionic gonadotrophin in oil is, in fact, advertised in a recent catalogue of veterinary products for this specific purpose.

Yours faithfully,

Alfred T. Cowie.

The National Institute for Research in Dairying.
Shinfield, Nr. Reading.
September 10th, 1946.

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Asdell, S. A. (1931.) *Science*. 73. 341.
———. (1932.) *Ibid*. 75. 131.
Corner, G. W. (1937.) *Ibid*. 85. 197.
Folley, S. J., & Malpress, F. H. (1944.) *J. Endocrinol*. 4. 1.
Koch, W. (1936.) *Tierärztl. Rdsch*. 42. 634.
Questions and Answers. (1945.) *Vet. Rec*. 57. 66.
Tyson, S. L. (1931.) *Science*. 74. 512.

. . . . . .

Our respondent to the original query published in the "Questions and Answers" feature on September 7th replies as follows to the subsequent criticism of Mr. Cowie, which appears above:

Mr. Cowie asks for evidence in support of the statement that large doses of oestrogen will suppress oestrus. As Mr. Cowie denies that menstruation and oestrus are analogous phenomena, first let me establish what I mean by "oestrus." It is the sexual cycle, comprising several phases (pro-oestrus, oestrus, metoestrus) during which occur maturation of follicles in the ovary, turgescence of the uterus and vagina and endometrial changes in the uterus, sexual desire, and ovulation in the ovary. This cycle in the animal is surely analogous to menstruation in the human. At least, it is popularly regarded as such; and when I speak of the suppression of oestrus (or of menstruation), it is the whole cycle and not merely one phase of it which is referred to. This and the following statements should dispose of Mr. Cowie's contention that *suppression of menstruation in women has no bearing on the question whatsoever*. It has a considerable bearing indeed.

"The uterus undergoes the same type of change in primates as in the lower mammals. The basal layer of its endometrium responds to oestrogen, generating, and in each new cycle, regenerating a functional layer, which is subsequently converted by action of progesterone to a receptacle suitable for a fertilized ovum."[1]

"Excessive oestrogenic stimulation prevents proper endometrial response to progesterone."[2]

Hartman has carried out a series of important studies on female monkeys and has demonstrated that the menstrual cycle so closely resembles that of women, that conclusions about one species may reasonably be applied to the other.[3]

"So-called mid-interval bleeding of women and female monkeys, the pro-oestrous bleeding of the bitch and the oestrous bleeding of the cow occur at about the time the Graafian follicle reaches full development and ruptures. In addition, both bitch and cow, and also the guinea-pig, exhibit some bleeding which in point of time corresponds to the menstruation of primates."[4]

If Mr. Cowie will now accept the imputation of these abstracts that menstruation in primates and oestrus in lower mammals are entirely similar phenomena induced by similar hormonal and other factors, is one not reasonably justified in assuming that what will affect the one will in all probability equally affect the other?

There is an abundance of evidence that menstruation may be suppressed by large doses of oestrogen. For instance, Gillman[5] states: "Oestrogen has been used to postpone the onset of the menstrual cycle . . . and there is no doubt that this can be achieved *provided adequate quantities of oestrogen are used*; the exact amount will obviously depend on the degree of sensitivity to oestrogen of the subject concerned. If the cycle is postponed there seems little doubt that this is achieved by inhibition of the ovaries, and this inhibition is maintained for as long as the oestrogen is administered. When treatment is suspended—oestrogen-withdrawal—bleeding supervenes after the usual latent period of five to eleven days. . . . If oestrogen treatment is continued over a period of several weeks all the follicles of the ovary may be destroyed as Zondek showed in the human female and as Gillman demonstrated in the baboon. . . . Similarly it has been shown that 5 mg. oestradiol benzoate administered on the eighth day of the cycle can delay the onset of menstruation for 16 days or even as long as 20 days. . . . There are similar alterations in the cycle of the baboon and woman after oestradiol."

Foss[6] has recommended (for postponement of the menstrual cycle) the repeated administration of *large quantities* of oestrogen, commencing in the first half of the cycle.

There is a great deal of similar evidence to be culled from the endocrinology journals, besides which it is well known that hormone products are regularly being sold to and used by the veterinary profession for the express purpose under discussion.

I could produce proof of that, confidentially, if the need arose. The fact that a veterinary surgeon may seldom be asked to suppress oestrus and therefore has little experience of the method, coupled with the average clinician's notorious apathy in recording his results, does not prove that suppression of oestrus cannot and has not been accomplished by giving doses of oestrogen.

Mr. Cowie has apparently slipped up when he castigates me for "introducing the monstrosity" or "coining the verb" *to oestruate*. I wish I could have been correctly so credited, for I think it is an excellent explanatory term; and if he will refer to Dorland's Medical Dictionary he will find it is an official and accepted verb. His four word suggested alternative "to be in oestrus" is not only cumbersome, but ill-fitting in many sentences. The writer is obliged for the gratuitous instruction on the meaning of "oestrus" and "oestrous."

References

(1) Cameron, A. T. "Recent Advances in Endocrinology." 5th edit. p. 242.
(2) Reynolds. (1939.) "Physiology of the Uterus." (New York.)
(3) Hartman, C. (1939.) *Endocrinology*. 25. 670.
———. (1941.) *Proc. Soc. exp. Biol*. 48. 221.
(4) Fluhmann. (1939.) "Menstrual Disorders."
(5) Gillman, J. (1942.) "Ovarian Response to Oestrogen." *J. clin. Endoc*. 2. 153.
(6) Foss, G. (1937.) *Brit. Med. J*. 2. 10.

A decrease of one-third in the number of tuberculosis-infected cattle in two years was reported by Glamorgan's inspector, Captain Leyshon, to the Diseases of Animals Sub-committee; in 1944 the average was six per 1,000, this year two per 1,000. It was also stated that 29,000 animals were being tested in the county every half year.

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The Royal Sanitary Institute will hold their 1947 "Health" Congress at Torquay, from June 2nd to 6th, at the invitation of the Corporation. The Rt. Hon. the Earl Fortescue, Lord Lieutenant of the County of Devon, will be President of the Congress.

IN PARLIAMENT

Hill Farming Bill

In the House of Commons on Wednesday of last week the above Bill passed the report stage and third reading.

Many members pressed for an adequate definition of exactly what "hill farming" is—feeling that the emphasis was wrongly placed in the Bill on sheep and sheep alone. Replying to this point, Mr. Tom Williams, Minister of Agriculture, said that the question had been fully re-examined and he was satisfied that it would be undesirable to widen the scope of the Bill. Let him say at once that the omission of the word "cattle" from the definition had no meaning in that cattle were normally associated with hill farming, and the right was taken by the Minister to introduce hill cattle and hill sheep subsidy schemes. That being the case, he ought to make the further observation that this was a Hill Farming Bill and not a marginal land Bill. If it had been the latter, he was sure the observations of most hon. Members would have been infinitely more pertinent than they were with regard to this Bill. The Bill was designed to help one of the most depressed sections of British industry. He hoped as a result of its provisions we should be able to provide ourselves with a great deal more meat from our hillsides than we had done for a long time past. The Bill might be regarded as a very small approach to a very large problem—but it was a start.

Mr. Snadden said the crux of the scheme was whether advantage would be taken of the Bill's provisions on a scale sufficiently wide to arrest the vast deterioration of hill lands.

Mr. E. Roberts hoped there might be devised a common plan which would solve the problems of hill farming on the one hand, and of afforestation on the other.

Mr. Skeffington-Lodge regarded the Bill as one more step in a concerted plan to ensure that all phases of British agriculture were put on a sound basis for the future.

Mr. Drayson said the sum of money which would be allotted under the Bill was far too small.

Mr. Kenyon while welcoming the assistance given to hill farmers, thought it was not necessary so long as the guaranteed market and the guaranteed price were maintained. But the whole success of the Bill depended upon the guaranteed price.

[The position of hill farming in Great Britain has been a matter of growing concern in recent years, during which it has not shared in the relative prosperity of lowland farming. In his paper to the Farmers' Club on the Monday preceding the debate on the Bill, Captain A. R. McDougal, a hill sheep farmer of Berwickshire, foretold that the Bill would fail in its purpose of rehabilitating hill farmers "because it entirely ignores the real cause of their deterioration, which is neglect of farming interests by the owners and bad conditions of tenure."]

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Questions

Milk Distribution (Committee)

Lieut.-Colonel Sharp asked the Minister of Food whether the Milk Distribution Working Party has yet submitted recommendations to him; and what action he proposes to take to ensure the efficient delivery of clean milk to the consumer.

Mr. Strachey: I have not yet announced the composition or terms of reference of the Committee on Milk Distribution, which has not yet begun its sittings. So I am afraid we cannot expect its recommendations just yet. The Chairman of the Committee will be Major-General Williams, C.B., C.B.E., Director of Freight Movement, War Office. The other members will be:—

Mr. F. W. Charles, F.C.A., C.B.E., Partner of the firm of Peat, Marwick Mitchell & Co., Chartered Accountants.
Miss R. Cohen, M.A., Director of Studies, Newnham College, Cambridge.
Mr. A. Sainsbury, Director and Joint General Manager of the firm of J. Sainsbury, Ltd.
Mr. G. Wansbrough, M.A., Director of the Bank of England.
Mr. H. Weeks, C.M.G., of Cadbury Bros., Ltd.

The terms of reference of the Committee will be:—

"To examine the distribution of liquid milk from the point at which it leaves the farm to the point at which it is received by the consumer or the manufacturer and to advise on any changes which are necessary to ensure that clean, safe milk is delivered as efficiently and cheaply as possible."

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Colonial Economic and Development Council

Sir Peter Macdonald asked the Secretary of State for the Colonies what are to be the composition and functions of the recently appointed Colonial Economic and Development Council; what are its terms of reference and to whom the Council is to be responsible.

Mr. Creech Jones: The members of the Council so far appointed are Lord Portal (of Laverstoke) as chairman, Mr. J. Benstead, Sir Bernard Bourdillon, Sir Graham Cunningham, Sir William Goodenough and Sir Drummond Shiels. I have one or two other appointments in contemplation and hope to announce their names shortly.

The Council's terms of reference are:

"To advise the Secretary of State for the Colonies on the framing and subsequent review of plans for economic and social development in the Colonial Empire and on questions of general economic and financial policy."

The functions of the Council are shown by these terms of reference. It will be responsible to me.

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Text-Books

Sir E. Graham-Little asked the President of the Board of Trade if he is aware that the shortage of medical text-books is a handicap to medical education; that many of the standard books in use by medical students are unprocurable, and, as examples submitted show, students and practitioners ordering these have been waiting nine months for delivery; and if he will take steps to remedy this position.

Sir S. Cripps: The main factors limiting the production of medical and other text-books, for which there are increasing and accumulated demands, is the shortage of labour and of paper. The numbers employed in the printing and book-binding trades are still well below the pre-war strength, although the labour force increased, in July, 1946, to 74 per cent. of its pre-war figure. Publishers' regular paper quotas have been substantially increased over the last 18 months—from 42½ per cent. to 80 per cent. of pre-war usage. In addition, it is open to any publisher who cannot bring out an important text-book merely from lack of paper to apply for a special allocation for that purpose.

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Agriculture: Education and Advisory Service

Mr. Swingler asked the Minister of Agriculture whether he will make a statement on the development of agricultural education, particularly in relation to the future of the Farm Institutes and the National Advisory Service of his Ministry.

Mr. Collick: My right hon. Friends the Ministers of Education and Agriculture recently sent local authorities a joint circular, of which I am sending my hon. Friend a copy, explaining the respective functions of the county agricultural education service, for which those authorities are responsible, and of the National Agricultural Advisory Service, and suggesting means by which the necessary close co-operation between the two services should be effected. The subject of farm institutes is being considered by the Joint Advisory Committee on Agricultural Education, and my right hon. Friends expect to receive their report before the end of this year.

NOTES AND NEWS

Diary of Events

Oct. 19th.—Scientific Meeting of the Nutrition Society (Scottish Group), in the Strathcona Club, The Rowett Research Institute, Bucksburn, Aberdeen, 2.30 p.m.

Oct. 23rd.—Meeting of the Ayrshire Division, N.V.M.A., at the Hannah Institute, Ayr, 2.45 p.m.

Oct. 23rd.—N.V.M.A. Committee Meetings, 36, Gordon Square, W.C.1: Parliamentary and Public Relations, 11.30 a.m.; General Purposes and Finance, 1.30 p.m.

Oct. 24th.—Annual Meeting of the Society of Veterinary Practitioners, at the Holborn Restaurant, London, 2 p.m.

Oct. 25th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds (Hotel Metropole), 2.30 p.m.

Oct. 30th.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at the Royal "Dick" Veterinary College, 2.30 p.m.

Oct. 30th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow (Ca'dora Restaurant, Union St.), 2.15 p.m.

Oct. 31st.—Meeting of the Lancashire Division, N.V.M.A., at Manchester (Grand Hotel), 2.30 p.m.

Nov. 2nd.—Joint Discussion Meeting of the Biochemical Society and the Society for General Microbiology, in the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11.15 a.m.

Nov. 5th.—R.C.V.S. Animal Management Examination, commencing in London.

Nov. 8th.—Meeting of the Mid-West Division, N.V.M.A., at Bath ("The Red House"), 2.30 p.m.

Nov. 9th.—Annual Meeting of the Society of Women Veterinary Surgeons, at the Holborn Restaurant, High Holborn, W.C.2, 11.15 a.m. As indicated in our Notices Column, luncheon in the Restaurant will be followed by an X-ray talk and demonstration by Mr. Gordon C. Knight, at the Royal Veterinary College.

Dec. 3rd and 4th.—R.C.V.S. Written Examinations begin.

New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

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Supply of Penicillin to Veterinary Surgeons

An amendment of the Control of Penicillin (No. 1) Order will come into force on November 1st, 1946.

This amendment will place veterinary surgeons on the same footing as registered medical or dental practitioners as regards the acquisition and disposal of penicillin.

The present procedure whereby veterinary surgeons obtain their penicillin through specially licensed suppliers will terminate therefore on October 31st.

There is, however, no necessity for a veterinary surgeon to disturb his present arrangements for securing penicillin, but this amendment of the Order does enable him to change his source of supply after October 31st should he so desire and to do this without reference to the Ministry of Supply. It also means that the scheme whereby forms of application (Form P.P.C./5) for obtaining supplies of penicillin were issued by the N.V.M.A. will be discontinued on October 31st.

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VETERINARY STATUS

"It can scarcely be the view of the Government that, in securing a satisfactory milk supply for the public, the condition of the roundsman's teeth is of greater importance than the eradication of tuberculosis from the dairy herds. This, however, would appear to be the logical deduction from the fact that, as a result of the low status accorded the veterinary profession, a higher scale of salaries operates for dental officers than for veterinary officers in the new Army scale," says *The Field* in its issue of October 12th, and proceeds: "In agricultural production, milk is food priority number one, but farmers are fully conscious that vast extension of the veterinary services available to agriculture is fundamental to the attainment of disease-free herds. That is why the president of the National Farmers' Union has pledged co-operation of his industry with the National Veterinary Medical Association in securing 'an animal health policy that will safeguard the animal population of this country.'

"It seems too much to hope that this can be secured while the new Agricultural Advisory Service comes into operation with the professional organization of the veterinary surgeons refusing to co-operate in staffing the Animal Health Division until a higher status be given than is reflected in a salary basis of £2,000 a year for the one 'plum' of the official service, the appointment of Chief Veterinary Officer of the Ministry of Agriculture. When the Minister of Agriculture broke off social relations with the veterinary profession by withdrawing his acceptance of the N.V.M.A.'s invitation to its annual dinner, Sir John Boyd Orr, who took his place, left no doubt as to the international view of the great part veterinary science has to play in the world's food supply."

The Minister does not seem to be particularly happy in his public dining these days. A fortnight ago he rather ostentatiously stayed away from the Veterinary Surgeons' annual dinner, while on Monday night, at the launching of the Association of Agriculture, he devoted most of what ought to have been a great speech for a great occasion to an attack on A. G. Street and those who think like him. In both cases Mr. Williams only succeeded in focusing attention where he probably did not want it, and did little to advance his own cause. The pity is, he is capable of so much bigger things.—*Farmers' Weekly* (October 11th).

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PERSONAL

Appointment.—The Colonial Secretary has appointed Mr. G. F. Clay (Development Adviser, Northern Rhodesia and Nyasaland) to be his agricultural adviser, in succession to Sir Harold Tempany, retired.

Birth.—Dixon.—On October 11th, 1946, at Hednesford, Staffs., to Alice, wife of R. J. H. Dixon, M.R.C.V.S.—a son.

Marriage.—Pearson—Irwin.—On Friday, September 20th, 1946, at Fisherwick Presbyterian Church, Belfast, James Kerr Love Pearson, B.SC., M.R.C.V.S., younger son of Professor and Mrs. A. F. Scott Pearson, Belfast, to Norah Emily Suffern Irwin, younger daughter of Mr. S. T. Irwin, F.R.C.S., University Square, Belfast, and the late Mrs. Irwin.

Forthcoming Marriage.—Mr. E. R. Cook and Miss K. M. Walpole.—The engagement is announced between Edward Rodney Cook, M.R.C.V.S., only son of Mr. and Mrs. Edward C. Cook, of "Hillmere," Park Avenue South, Northampton, and Katharine Margaret Walpole, W.R.N.S., only daughter of Mr. and Mrs. F. W. Walpole, of Oakwood, Limpsfield, Surrey.

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R.C.V.S. OBITUARY

Taylor, Frederick John, T.D., Major, late R.A.V.C., 23, Beaumont Street, Oxford. Graduated London, June 12th, 1895. Died, October 8th, 1946; aged 72 years.

Major Frederick John Taylor, T.D., M.R.C.V.S.

An Appreciation

We record Major Taylor's death with deep regret and are glad to be able to publish the following tribute to him.

Tuesday, October 8th, saw the passing of Major Frederick John Taylor, T.D., M.R.C.V.S., at his residence in Oxford.

Frederick Taylor was born at Wednesbury, Staffordshire, in 1874, and qualified at the Royal Veterinary College, Camden Town, in 1895.

He practised first in Birmingham from 1897 until 1913 when, on account of ill-health, he retired to Folkestone.

A year later, having recovered his health, he joined the late Sir Frederick Hobday, but this alliance was broken up on the outbreak of the 1914-18 war when Frederick Taylor was embodied into the R.A.V.C. He saw service with the Corps for the duration of the war both at home and overseas.

At its termination he took up practice at Bath but soon ill-health forced his temporary retirement once more. After several months' convalescence he purchased the practice of the late Richard Verney at Oxford and continued as its principal until his death. He was appointed veterinary surgeon to the City of Oxford and rapidly became a prominent figure in the community.

As a professional colleague he was at all times the first to offer advice, assistance and support and through his strict observance of professional ethics the reputation of the profession in the locality was greatly enhanced. It was always a pleasure to contact Frederick Taylor professionally and one sought continually for opportunities to return his many kindnesses.

Possibly he stirred the greatest admiration by his continual battle with the ill-health which dogged him for the latter part of his life. Many times he insisted upon performing a heavy day's work when his friends would have felt happier had he not stirred from his bed. He concealed his recurrent sicknesses so well that only his intimates realized the handicap under which he carried on at times.

One other part of his life must be mentioned if only for his intense pride in it and that is his long service in the Territorial Army. He has been heard to say that he regarded his Territorial Decoration with only less affection than his diploma of membership of the Royal College.

He became a veterinary lieutenant in the Royal Horse Artillery at the age of 19 and saw further service with the Royal Warwickshire Yeomanry and the Royal Wiltshire Yeomanry until their mechanization in 1920.

During his life he gave much time and energy to the social and political activities of his profession and for a period served as councilman to the Royal College.

He filled the offices of President to the Midland Veterinary Association and to the Royal Counties Veterinary Medical Association and was a regular and active attender at the meetings of the latter body almost to the end of his life.

The sympathy of his many friends in the profession will be extended to his widow who has been such a tower of strength to him, and to his son and three daughters. E. J. H.

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LEGAL NOTES

Alleged Cruelty to Cats at Oxford

A Fine Reduced and an Appeal Allowed

At Oxford City Quarter Sessions last week were heard the appeals of Dr. Edward George Tandy Liddell, Waynflete Professor of Physio-

logy at Oxford University, of The Hermitage, Old Headington, Oxford, and Mrs. Gladys Kathleen Scragg, of Southmoor Road, Oxford, against the decision of the Oxford city magistrates by which they were fined £25 and £5 respectively on a summons alleging that they caused unnecessary suffering to a number of cats by unreasonably omitting to give them proper and necessary care and attention. Professor Liddell was also ordered to pay ten guineas towards the costs of the prosecution.

The Recorder (Mr. J. Foster) said that he would allow the appeal of Mrs. Scragg but would dismiss the appeal of Dr. Liddell. None of the allegations was proved against Dr. Liddell except that of overcrowding, and therefore he would reduce the fine of £25 imposed by the city magistrates to £5.

An extended report of the hearing before the Oxford magistrates appeared in our issue of July 6th (*Vet. Rec.* **58**. 293-295).

"Public Emotion."

Giving his decision, the Recorder commented that there was often a lot of public emotion and lack of judgment regarding offences against animals. "It is only fair to Dr. Liddell and to Mrs. Scragg to say that I accept their evidence as to the facts in its entirety," he went on. In my view, Dr. Liddell acted, except in one particular—overcrowding—in a proper and humane manner as regards treating the abscesses and wiping the cats' eyes.

"I think that the witnesses for the Society were entirely honest, but were upset by the sight of this very distressing distemper and failed, in my view, to distinguish between the natural symptoms of distemper which it was impossible to cure while the disease was raging, and the further aspects of the disease.

"I find that Dr. Liddell and Mrs. Scragg acted properly in cleaning the compound and with regard to the other allegations, apart from overcrowding."

Dr. Liddell, he considered, made an error of judgment in putting too many cats in the compound while they were suffering from distemper, and he considered alternative accommodation could have been found for the cats which had recovered. "I want to make it clear," he went on, "that Dr. Liddell performed no cruel experiments. This is not an issue between the merits and demerits of the section of the Act, and no such issue is involved. Dr. Liddell was conducting experiments on these cats, and I accept his evidence entirely on that. In my view, the experiment was a non-painful experiment, and it was designed, as Mr. Long (for the appellants) has said, to cure the disease."

Mr. A. J. Long, K.C., and Mr. John F. Bourke (instructed by Mr. F. Winstanley) appeared for the appellants, and Mr. Gordon Jones and Mr. M. A. B. King-Hamilton for the R.S.P.C.A.

Early in the hearing of the appeal, which lasted three days, Mr. Long said that it would be submitted that there was no neglect on the part of Dr. Liddell bringing about suffering to the animals. The Professor was carrying out a *bona fide* experiment on the group of cats for the sulphamethazine treatment. When the evidence had been heard there ought to be no finding that suffering was caused by neglect.

Dr. Liddell, in evidence, said that cats for the purposes of experiments were sold to the university by animal dealers. Between May 14th and 21st this year there was an epidemic of distemper. He decided early this year that at the first outbreak of cat distemper he would try the effect of sulphamethazine in a large group experiment. No healthy cat was put into the enclosure in the department in order to let it catch distemper. There was a fan in the roof of the room, a stove kept at the right temperature, an ultra-violet lamp—which was said to have a beneficial effect—and sawdust on the floor. He kept records of each case and the date of each dose, and gave the drug three times a day by mouth. All the cats in the enclosure were not getting the drug, but if they became sufficiently bad they would be put on it. Any animal which he thought ought to have the drug was given it. The drug was never given for more than five days. At the end of that time the experiment was stopped to observe the result.

After Dr. Liddell had given further evidence: Mr. Long: It has been pretty nakedly suggested that the idea that you were experimenting with regard to these cats is untrue and an afterthought?—No, certainly not. I have the book here with the records. The book was handed to the Recorder.

The Recorder: How would you describe the scientific object of the experiment?—The alleviation rather than the cure of cats' distemper.

Mrs. Gladys Kathleen Scragg said in evidence that the cat enclosure was cleaned every morning. On the morning the society's inspectors came, she had cleaned out the compound and there was no dead cat in it.

Veterinary Evidence

The case for the prosecution included evidence from Mr. G. B. Taylor, M.R.C.V.S., of Oxford and Major R. C. G. Hancock, M.R.C.V.S., of the R.S.P.C.A. The former, who accompanied two inspectors to the animal house of the University Department of Physiology, said he considered that six healthy cats would be a large enough number for a cage of the size of the compound provided. With 34 cats there it was overcrowded.

Five of the cats he handled and took to his surgery were definitely emaciated. The degree of emaciation could not have arisen in two or three days.

Major Hancock said a tortoiseshell cat weighed 3½ lb., whereas in normal health it should have weighed between 7 lb. and 10 lb. Another cat weighed 4 lb. 6½ oz., and a third 4 lb. 9 oz., while the fourth weighed 2 lb. 13 oz., and he would say this was very emaciated. From what he had heard that day there had been neglect from several aspects.

After Mr. Long had addressed the Recorder for the appellants, Dr. Tom Hare, a director of a veterinary research laboratory, said the running of the eyes was a regular symptom of cat distemper. Sawdust on the floor was the best covering, and was one he always used and invariably advised.

Dr. Hare said that loss of weight in a cat was caused through dehydration, and in the case of young cats he had known them to lose 50 per cent. of their body weight in under 24 hours. He thought Professor Liddell had done all that was reasonably possible.

Professor Harold Burrow, of the Royal Veterinary College, said he considered Professor Liddell had done everything he could to cope with a very difficult situation when faced with an outbreak of distemper.

He was satisfied that the cats suffered no discomfort from overcrowding.

Dr. William Percy Blunt, F.R.C.V.S., formerly in charge of animals at one of the Government experimental chemical stations, expressed the opinion that 70 degrees in the cat compound was not excessive.

Sir Howard Florey, F.R.S., Professor of Pathology at Oxford, said he had 23 years' experience of the use of animals in experiments. In all laboratories he had been associated with, sawdust had been used, and they were instructed by the Home Office to do so. He saw no objection to the number of cats kept in the compound. Interference with their eyes should be kept to the minimum, and the temperature of 70 degrees was, in his opinion, correct.

Dr. Arthur D. Gardner, Professor of Bacteriology at Oxford, said he could not see any neglect in the treatment Professor Liddell gave the cats.

Mr. Long, in his final speech, said that in his submission there was no evidence of neglect or of suffering by neglect such as would warrant a finding that the case was ever within the 1911 Act. "What Professor Liddell was doing was as much with the object of relieving the animals of their suffering as of acquiring scientific knowledge."

If Mrs. Scragg were to be implicated, any domestic servant in a house where there was a cat, who played her part in feeding the cat, could be convicted every time the owner of the cat fell short of his duty.

Mr. Gordon Jones said if the tale of the prosecution were true, or even half-true, what a pitiable tale it was. "All this happened in the name of science carried out by a professor of distinction who, when I put all the facts at their worst, says, 'I fully approve of all the conditions.'

"Not a single witness of repute has been called from inside the Department—no-one who had any dealings with these cats themselves. There was every opportunity for Dr. Liddell, when he knew this trouble had arisen, to get the most valuable assistance."

After the Recorder had announced his decision, it was stated that the parties had come to an agreement concerning costs.

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"BLOODSTOCK GAIN"

"In William Miller the Veterinary Educational Trust have got an able man to be Director of their equine research station at Balton Lodge, Newmarket," observes the *Farmer and Stock-Breeder* in a recent issue, and proceeds: "As the first Professor of Animal Husbandry at the Royal Veterinary College he has done a great deal to interest the younger generation of veterinary surgeons in management and husbandry aspects of livestock production as well as in disease.

"He has, in addition, provided the Government with some good reports of animal production generally, based on observations during his visits to the West Indies and West Africa. It seems, in fact, rather a pity that such a good all-round animal man has been tempted into the specialist atmosphere of Thoroughbreds. We must hope for as good a successor."

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Despite the shortage of shipping space and priorities given to other classes of export, the Livestock Export Group has, during the last twelve months, been able to secure freight for the export of 1,057 head of pedigree livestock. This is a greater number than has been exported during the past three years.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Surrey.—Farleigh House Farm, Farleigh Common, Farleigh, Warlingham, Surrey (Oct. 9th).

Southants.—Broom Cottage, Forest Road, Bordon, Hants. (Oct. 11th).

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Dr. A. N. Drury, Mr. Joseph F. Duncan, and Professor T. J. Mackie have been appointed members of the Agricultural Research Council in succession to Professor D. Keilin, Major James Keith, and Professor F. T. Brooks, whose terms of office have expired.

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED SEPTEMBER 30TH, 1946.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	33	33	734	410
Berkshire	—	75	79	2,889	1,866
Buckinghamshire	2	66	68	2,500	1,321
Cambridge	—	10	10	199	79
Chester	2	313	315	381	4,022
Cornwall	—	4	4	72	75
Cumberland	—	55	55	1,367	1,150
Derby	1	310	311	8,738	5,045
Devon	1	313	314	4,695	2,710
Dorset	—	64	64	2,049	1,121
Durham	1	246	247	5,261	2,247
Essex	—	206	206	6,953	4,338
Gloucester	—	77	77	2,082	1,517
Hampshire	1	332	333	9,545	6,599
Hereford	—	9	9	234	115
Hertford	—	77	77	2,236	1,507
Huntingdonshire	—	7	7	280	168
Isle of Ely	—	1	1	57	21
Isle of Wight	—	4	4	52	39
Kent	—	147	147	3,426	2,033
Lancashire	—	131	131	3,942	1,362
Leicestershire	—	78	78	1,999	1,560
Lincs (Holland)	—	3	3	25	11
Lincs (Kesteven)	—	19	19	196	188
Lincs (Lindsey)	—	87	87	1,658	1,016
Middlesex	—	13	13	419	219
Norfolk	—	120	120	3,821	2,196
Northamptonshire	—	66	66	1,873	1,646
Northumberland	1	53	54	1,686	1,180
Nottinghamshire	—	164	164	3,588	2,256
Oxford	—	39	39	1,088	1,845
Rutland	—	1	1	24	11
Salop	—	220	220	6,363	3,383
Soke of Peterborough	—	—	—	—	—
Somerset	—	241	241	6,258	2,948
Staffordshire	—	175	175	4,360	3,594
Suffolk, East	—	56	56	1,233	856
Suffolk, West	—	44	44	789	628
Surrey	2	97	99	2,882	1,426
Sussex, East	—	127	127	3,460	2,301
Sussex, West	1	102	103	2,831	1,630
Warwick	—	116	116	2,647	1,889
Westmorland	—	7	7	176	173
Wiltshire	—	77	77	3,028	1,248
Worcester	—	137	137	2,580	1,305
Yorks, E.R.	—	95	95	1,671	903
Yorks, N.R.	—	95	95	3,109	130
Yorks, W.R.	—	218	218	5,182	2,080
WALES					
Anglesey	—	48	48	820	596
Brecon	—	11	11	194	126
Caernarvon	—	62	62	883	459
Cardigan	—	39	39	712	458
Carmarthen	3	223	226	4,287	2,208
Denbigh	—	27	27	583	286
Flint	—	44	44	1,002	566
Glamorgan	—	64	64	997	469
Merioneth	—	10	10	137	65
Monmouth	—	47	47	1,077	558
Montgomery	—	14	14	1,283	248
Pembroke	—	32	32	662	617
Radnor	—	—	—	—	—
TOTALS	15	5,555	5,570	142,185	81,113

Notes.—(1) Operative periods of undertakings: 1 year, 1,524; 2 years, 365; 3 years, 3,681. (2) Undertakings renewed for further periods: 1 year, 2,114; 2 years, 235; 3 years, 851. (3) Undertakings not renewed at ends of operative periods, 2,408. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings, and do not include those renewed for further periods. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	—	18	18	942	438
Angus	—	16	16	626	430
Argyll	—	2	2	33	74
Ayr	—	13	13	416	259
Banff	—	1	1	120	20
Berwick	—	—	—	—	—
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	4	4	161	103
Dumfries	—	11	11	591	542
Dunbarton	—	1	1	69	40
East Lothian	—	1	1	20	8
Fife	—	26	26	939	534
Inverness	—	2	2	106	46
Kincardine	—	2	2	81	48
Kinross	—	3	3	62	43
Kirkcudbright	—	9	9	980	755
Lanark	—	7	7	296	225
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	—	—	—	—
Perth	—	7	7	253	204
Renfrew	—	4	4	151	101
Ross-shire	—	1	1	58	43
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	9	9	293	277
Sutherland	—	2	2	41	6
West Lothian	1	—	1	33	19
Wigtown	—	15	15	994	555
Zetland	—	—	—	—	—
TOTALS	1	154	155	7,256	4,770

Notes.—(1) Duration of undertakings: 1 year, 49; 2 years, 8; 3 years, 98. (2) Undertakings renewed for a further period (included in column 2 of statement). 1 year, 84; 2 years, 9; 3 years, 65. (3) Undertakings expired and not renewed (not included in column 2 of statement): 236. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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WORLD FOOD BOARD PLAN

Mr. S. M. BRUCE, F.R.S., has been appointed chairman of the preparatory commission appointed at the F.A.O. conference in Copenhagen to examine methods for setting up a world food board. The first meeting of the commission will be held in Washington on October 28th. Mr. Bruce, who was Prime Minister of Australia from 1922 to 1929 and represented Australia in London from 1932 to 1946, took a leading part in the social and economic work of the League of Nations.

On Friday of last week Mr. S. M. BRUCE spoke at a Press conference in London about his recent appointment.

The task of the commission which meets in Washington on October 28th, will be to examine methods for establishing a World Food Board on the lines suggested by Sir John Boyd Orr. Mr. Bruce said that, though he had no idea how long the deliberations in Washington would take, he felt that if they were to be useful they ought to be got through in two or three months.

The 16 member nations have invited three other nations—Soviet Russia, Argentina, and Siam—to be represented at the meetings of the preparatory commission, and their replies are awaited. Mr. Bruce said that no alternative proposals to those of Sir John Orr had yet been submitted, but Governments were being asked to put forward suggestions or alternatives. It would not be for the commission to work out the diets necessary for health. Rather would its task be to indicate the best machinery for providing the diets deemed necessary by the F.A.O.

He thought it was now abundantly clear that there had been a complete reversal of the attitude of all the nations that found expression at the World Economic Conference of 1933. The conclusion then reached was that the only way to meet economic storms was by restricting production; and Mr. Bruce recalled that his own was the only voice raised at the conference in violent opposition to that policy. Since 1933 the mind of the nations had changed completely, and there was now practical agreement that the way to deal with the situation was to increase consumption and not reduce production.

. . . . .

SIR JOHN BOYD ORR

"At the Veterinary Medical Association dinner I was glad to see Sir John Boyd Orr in good fettle after the strenuous time he had in Copenhagen directing the affairs of the Food and Agriculture Organization," observes the Editor of *Country Life* (October 11th), and continues: "Now he is in the United States again, pulling together the threads that he hopes will give us

eventually a world-wide organization ensuring plenty of good food for all consumers and, as a corollary, steady prosperity for the food producing community able to count on a certain market. If Sir John can realize his hopes he will do as much as any man to establish the good name of U.N.O. as a world force capable of engendering more than talk and bickering. The call to continue his work as Director-General of F.A.O. is so strong that Sir John is giving up his seat in Parliament, where he represents the Scottish Universities. Although he has not been able to take a leading part in this Parliament because he has been away from this country so much, Sir John has the practical farming knowledge and sound sense in matters of agricultural policy that are needed at Westminster. He has always managed to keep his feet on the ground, despite his high ideals, and some of his firmest friends are among the leaders of the National Farmers' Union. At Copenhagen and previous conferences Mr. James Turner, President of the English N.F.U., has been able to judge for himself the potential value to agriculture of the F.A.O. plans."

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IMMUNIZATION WITH THE VOLE BACILLUS

"The vole bacillus, or the murine type of tubercle bacillus, occurs as a natural pathogen in some of the wild mice of Britain," states the *Lancet* in an annotation published on July 6th, and continues: "It was first described by Wells [1] in 1937, when he was collaborating with Elton in a study of the diseases of voles in Great Britain. Tuberculosis in voles is a widespread disease, and is the only known instance of tuberculosis affecting wild animals in their natural habitat. The type of tubercle bacillus causing tuberculosis in voles is not pathogenic to the usual laboratory animals, the infection caused by the inoculation of the bacillus being transitory. This led Wells & Brooke[2] to investigate the question whether inoculation of guinea-pigs with the vole bacillus increased their resistance to subsequent infection with the human or bovine types of tubercle bacillus. Their experiments were interrupted at the outbreak of war and the animals had to be killed. At that stage of the experiment they concluded that vaccination of guinea-pigs with the vole bacillus gives a degree of protection against subsequent infection with virulent mammalian tubercle bacilli which is apparently far greater than has been recorded by other means.

The immunization experiments in guinea-pigs have been repeated by several workers (Griffiths & Dalling[3] in this country, Irwin & O'Connell [4] in Canada, Wahlgren *et al.*[5] in Sweden, Corper & Cohn [6] in America, and Birkhaug [7] in Norway). The methods employed differ widely, but all agree that a pronounced increase of resistance to infection with virulent tubercle bacilli follows inoculation with the vole bacillus. It is quite clear, however, that in the guinea-pig resistance does not amount to immunity. The effect of inoculation is a delay, often very considerable, in the establishment of generalized disease after infection with virulent tubercle bacilli, but death from tuberculosis eventually follows. The painstaking work of Birkhaug makes this abundantly clear. The average survival time of twelve unvaccinated guinea-pigs after infection with virulent tubercle bacilli was 192 days, whereas that of twelve animals vaccinated with the vole bacillus before infection was 403 days.

"It is still uncertain how the resistance conferred on guinea-pigs by vaccination with the vole bacillus compares with that produced by B.C.G. The results of Wells & Brooke, of Irwin & O'Connell, and of Wahlgren and colleagues, suggest that in the earlier stages of artificial infection vaccination with the vole bacillus produces the greater resistance. Corper & Cohn, and Birkhaug, on the other hand, have found that the resistance conferred is about equal, if the animals are allowed to survive. It is very doubtful if immunity experiments in tuberculosis in the guinea-pig can be translated into terms of human immunity. The guinea-pig is absolutely susceptible to infection with mammalian tubercle bacilli and shows no natural resistance to progressive infection. In man, natural resistance, or resistance acquired as a result of previous infection, can completely overcome a tuberculous infection. In other words, infection in the guinea-pig is inevitably fatal; whereas the result in man is determined by the balance between natural or acquired resistance and the infective process. An increase in resistance in man may lead to healing of the infection; an increase in resistance in the guinea-pig merely delays its death.

"There are several questions still to be answered before the vole bacillus can be considered for human vaccination. Is it incapable of producing progressive disease in man? Will it convert a negative reactor to tuberculin into a positive reactor, and how long does this sensitivity last? Can human vaccination with the vole bacillus be done without causing severe local or general reaction? Does human vaccination confer increased resistance to tuberculosis? It is hoped that the first three questions may soon be answered. The last question is vital, but the answer may be delayed for some time. Evidence of this nature is notoriously difficult to collect, and careful planning will be needed if the answer is not to be indefinitely postponed."

1 Wells, A. Q. *Lancet.* (1937.) i. 1221.
2 Wells, A. Q., & Brooke, W. S. *Brit. J. exp. Path.* (1940.) **21.** 104.
3 Griffith, A. S., & Dalling, T. *J. Hyg., Camb.* (1940.) **40.** 673.
4 Irwin, D., & O'Connell, D. C. *Canad. med. Ass. J.* (1943.) **48.** 486.
5 Wahlgren, F., Olin, G., & Widstrom, G. *Nord. Med.* (1944.) **22.** 943.
6 Corper, H. J., & Cohn, M. L. *Amer. J. clin. Path.* (1943.) **13.** 18.
7 Birkhaug, K. *Amer. Rev. Tuberc.* (1946.) **53.** 411.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Grading-up.—At a conference of the British Society of Animal Production recently held in Glasgow, Mr. Joseph Edwards, of the Milk Marketing Board, Thames Ditton, mentioned that one of the revelations of the war years was the poor level of a great number of our dairy herds. Now, however, a new interest in the breeding of dairy cattle is being shown and dairy farmers are convinced that to ensure efficient production more certainty is required in methods of breeding for milk production.

The pedigree system is the nearest approach to ideal breeding, but as the number of pedigree herds in existence is relatively small it would take many years to raise the standard of dairy herds if pedigree breeding was the only means of improvement. The best and quickest way in which a farmer can improve his cows is by means of the grading-up system. By this means it is possible for the progeny of a mixed herd, in which any one breed is predominant and beasts are of a good type, to be raised in the course of five generations to pedigree status. Many Dairy Breed Societies carry an official Grading-up Register. A farmer who wishes to grade up his herd has his foundation cows inspected by the society and if they are satisfactory they are entered in the grading register as Class "A." These animals are then mated to a pedigree bull of the same breed and the heifer progeny are entered in the register as "B" animals. This process is continued for four generations and the heifer calves of Class "D" cows are entered in the pedigree herd book of the society. Only heifer calves can be graded-up to pedigree lines. The success of the scheme depends upon the use of good bulls of the same breed and if possible of the same type.

The best advice that can be given to those who may be considering grading-up their herds is to have a definite type in mind and to stick to it, to record daily and study the records. It is impossible to carry out successful grading-up without knowing what the cows are yielding. One cow may be giving three to four gallons a day when at her best, but over 12 months she may actually be giving less milk than one that at her peak only gave 2½ to three gallons per day. Unless records are kept, the length of time a cow is in milk often amounts to guesswork. Records show when she has been in milk for two months and if she has not returned to the bull something can be done to get her in calf again.

Grading-up is a long process, but if it is done intelligently it will lead to a herd that will breed true to type.

* * * * *

"PATENT" MEDICINES

In an editoral published under the above heading, in its issue of August 24th *The Lancet* observes:—

"The publication of *Secret Remedies* and *More Secret Remedies* by the British Medical Association[1] some 35 years ago drew public attention to a public scandal. Though analyses of many worthless 'patent' medicines had previously been published in these columns and elsewhere, the two books represented a declaration of war by the profession. At first success seemed certain; a Royal Commission was set up and declared itself emphatically against 'cunning swindlers who exploit for their own profit the apparently invincible credulity of the public.' Unhappily, its report was published on August 4th, 1914, and for the next four years Parliament was otherwise occupied; but the Commission's findings have remained the yardstick for the measurement of progress. That substantial progress has been made cannot be denied, though legislation still falls short, in some respects, of that recommended in 1914. Among Parliament's contributions have been the elimination, in 1917, of the treatment of venereal diseases by the unqualified; the Dangerous Drugs Act of 1920, which stopped the sale of drugs of addiction

except by a doctor's order; the Poisons Rules of 1935, which require that any preparation containing a poison must be explicitly labelled; and, perhaps most important of all, the Pharmacy and Medicines Act of 1941, which in the turmoil of the second world war slipped on to the statute book almost unnoticed, except by the trade. Its outstanding provision is that the formula of 'any article consisting of or comprising a substance recommended as a medicine' must be disclosed on the label, though unfortunately it does not insist that the substances should be called by their usual names. Other bodies, too, have played their part. The Pharmaceutical Society, under the Pharmacy and Poisons Act of 1933, has a disciplinary committee competent to strike from the register a pharmacist shown to have been guilty of misconduct; a considerable section of the daily Press, through the Newspaper Proprietors' Association, acknowledges a self-imposed censorship of advertisements; and the Advertising Association, the Proprietary Association of Great Britain, and the Chemists' Friends Association all have agreed codes.

"Is this enough? Mr. Hugh Linstead, M.P., himself a pharmacist of wide administrative experience, replies emphatically No in a monograph[2] which, if it misses the incisiveness of the late Professor A. J. Clark's classical review of the same field,[3] is yet a balanced and scrupulously fair survey. Mr. Linstead very properly explains that, despite the booklet's title, his quarrel is not with patent medicines (for with present-day law there are none) nor with the reputable proprietary preparations which most doctors are glad to use, but with the more dubious concoctions sold direct to the public—whose advertisement fosters needless fear of disease and which slim the nation's purse to the tune of £12-15 million a year. He gives a moderate but informative account of the subtleties by which this money is wheedled out of the public's pocket: he has a word for the unsolicited testimonial, the pseudo-scientific jargon and the extravagant claims of advertisements, the stimulation of false hope in the chronically sick, and, above all, the reliance on fear. On the effects of the trade he is at one with Clark, who held that 'the harm done by the frightening of individuals is much less serious than the harm that results from subjecting the public to a steady stream of misinformation regarding the elementary laws of health.'

"Mr. Linstead ascribes omission to control the trade not so much to vested interest or awe of the Press (which, of course, is closely affected) as to lack of public demand. The truth, he says, is that most manufacturers see to it nowadays that active ingredients are contained in their preparations, and one way or another, most of them do benefit their adherents. But he thinks that this trade fosters disease-consciousness, and leads to the postponement of seeking skilled advice, and that prices are often excessive. He suggests that the Minister of Health should be charged with over-seeing proprietary medicines; that a register of manufacturers and medicines should be kept, and that a medicine not complying with statutory conditions should be suppressed; and that advertisement and postal offers of diagnosis and treatment should be more strictly controlled, particularly to exclude false, misleading, or exaggerated claims.

"Mr. Linstead sees in this an element of conflict between State and individual; for he adds that 'the advertising of proprietary medicine undermines public confidence in a State medical service and in the registered medical practitioners at whose hands such a service must be provided.' Perhaps Mr. Bevan also holds this view; during the committee stage of the National Health Service Bill he was heard to say that he regarded extension of the law 'as a matter of some urgency.'[4] The captious may reason that the warrant for further legislation was as valid years ago as it is to-day; but few will dispute the need for legislation, whatever the reasoning behind it. It will not be easy. What, for example, are to be the 'statutory conditions' which the Minister of Health is to enforce, and how are they to be interpreted? In pharmacology the borderline between the active and the inert, between the therapeutic and the useless dose, is still often obscure: and if some of the conditions are to rest on such data, the Minister may be denied the precise guidance he will need. But we should not be deterred by punctilio. The *Economist*,[5] advocating the control of advertisements and a cost analysis, says: 'If the patient does not believe the doctor when he is told that there is nothing the matter with him, or if he does not want to consult a doctor at all, he will be able to buy medicines that do not require a medical prescription at the chemist's shop. . . . But at least he will not be subjected to constant external pressure to make him into a constipated hypochondriac.' We may all accept at least this modest ambition as a first aim."

(1) Secret Remedies. B.M.A., London, 1909. More Secret Remedies, 1912.
(2) Patent Medicines: an Indictment. Hugh Linstead. Obtainable from *National News-Letter*, 162, Buckingham Palace Road, London, S.W.1. Pp. 33. 1s.
(3) Clark, A. J. Patent Medicines, London, 1938.
(4) Standing Committee C: official report, July 2nd, 1946, para. 950.
(5) January 6th, 1945.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

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WAR-TIME LITERATURE ON CANINE DISEASES

An Appeal

Sir,—A Dutch practitioner has written to me asking that as much war-time literature on canine diseases as is possible, may be sent to him for his and his colleagues' perusal. He really needs any spare copies of *The Veterinary Record* or *Journal*, or other periodicals, and reprints of canine articles, which I may be able to collect.

Can any reader oblige in this direction, by posting to me what can be spared? I will then transmit the whole to Holland.

May I take this opportunity of thanking in advance all who are kind enough to co-operate.

Yours faithfully,

"Croyland," 658, Finchley Road, Golders Green, N.W.11. H. Kirk.

October 11th, 1946.

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PROPAMIDINE IN TREATMENT OF SUMMER MASTITIS

Sir,—Would you please allow me to correct a mistake which was printed in my letter on the above subject in your issue of October 12th.

The injection is of considerable use "*even when the secretion is either straw-coloured or blood-stained*"—as is the case, of course, in practically all cases of summer mastitis.

Camden House, London Road, Stroud, Glos. T. J. Margarson.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Sept. 16th to 30th, 1946 ...	2	2	—	5	9
Corresponding period in—					
1945 ...	8	1	—	45	51
1944 ...	5	11	—	3	129
1943 ...	11	—	—	2	19
Total Jan. 1st to Sept. 30th, 1946 ...	69	33	7	66	326
Corresponding period in—					
1945 ...	88	110	6	96	753
1944 ...	138	83	7	80	994
1943 ...	218	15	6	115	401

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at September 30th, 1946, was as follows:—

England	Wales	Scotland	Total (Great Britain)
6 560	10,171	7,364	24,095